Volunteer Lake Assessment Program Individual Lake Reports

CONTENTION POND, HILLSBOROUGH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,984	**Max. Depth (m):**	9.9	**Flushing Rate (yr^{-1}):**	2.9
Surface Area (Ac.):	95	**Mean Depth (m):**	4.2	**P Retention Coef:**	0.53
Shore Length (m):	2,900	**Volume (m^3):**	1,605,000	**Elevation (ft):**	857

TROPHIC CLASSIFICATION

Year	Trophic class
1985	MESOTROPHIC
2004	MESOTROPHIC

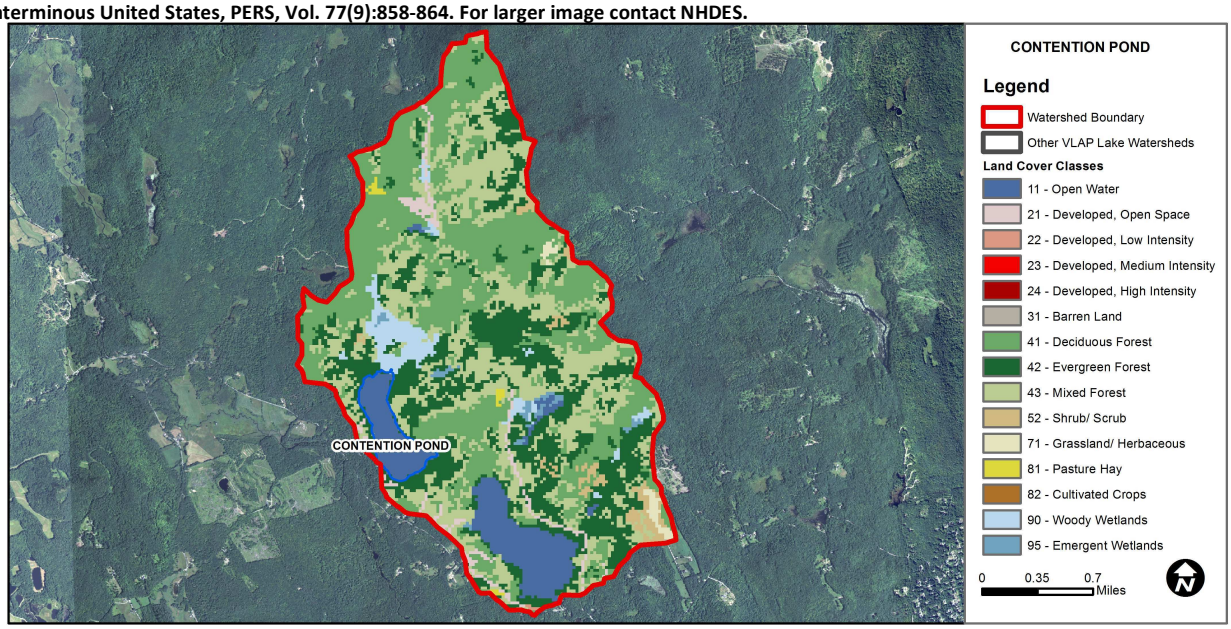
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
	Chlorophyll-a	Encouraging	< 10 samples and no exceedance of criteria. More data needed.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

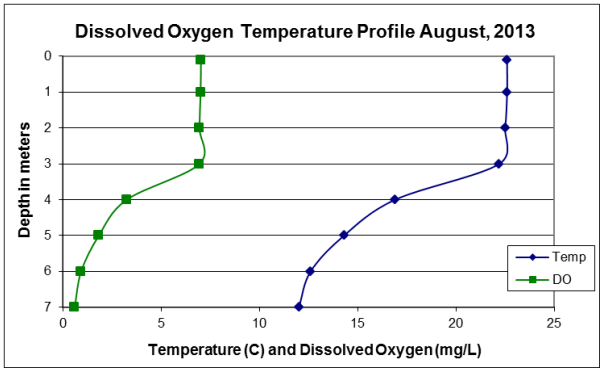


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.39	Barren Land	0.02	Grassland/Herbaceous	0.57
Developed-Open Space	2.11	Deciduous Forest	32.14	Pasture Hay	0.3
Developed-Low Intensity	0.04	Evergreen Forest	23.99	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	27	Woody Wetlands	2.95
Developed-High Intensity	0	Shrub-Scrub	1.75	Emergent Wetlands	0.7

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
CONTENTION POND, HILLSBOROUGH, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels increased slightly from 2012 but remained below the NH lake median. Visual inspection of historical data indicates variable chlorophyll levels.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride levels were low and well below the NH lake median values. Visual inspection of historical data indicates relatively stable epilimnetic conductivity.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) phosphorus increased slightly from 2012 but remained below the NH lake median. Hypolimnetic (lower water layer) phosphorus was elevated and the turbidity was also slightly elevated. Field data note very windy conditions that could have caused the anchor to disrupt bottom sediments. Visual inspection of historical data indicates slightly increasing (worsening) epilimentic phosphorus. Tributary phosphorus levels were low.
- **TRANSPARENCY:** Non-viewscope transparency was much lower in 2013 due to excessive wind and wave action during sampling. Viewscope transparency was much deeper and better than the NH lake median. Visual inspection of historical data indicates variable transparency from year to year.
- **TURBIDITY:** Deep spot and tributary turbidity was low except for the Hypolimnion. Gusty wind conditions could have caused the anchor to move and dislodge bottom sediment contributing to the turbidity.
- **PH:** Deep spot and tributary pH levels were less than desirable range 6.5 – 8.0 units and potentially critical to aquatic life. Visual inspection of historical data indicates decreasing (worsening) epilimnetic pH.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels were sufficient in the epilimnion, but decreased to low levels in the metalimnion and hypolimnion.
- **RECOMMENDED ACTIONS:** Increase monitoring frequency to three times per summer to better assess seasonal and historical water quality trends, and decrease annual variability. The increasing epilimnetic phosphorus is concerning and may be a result of stormwater runoff from the increasing volume and intensity of significant storm events. Educate lake and watershed residents on ways to reduce stormwater runoff from their properties utilizing DES' "Homeowner's Guide to Stormwater Management".



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2013 Average Water Quality Data for CONTENTION POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	3.20	4.05	3	19.1	11	1.30	4.40	0.79	6.04
Metalimnion				23.3	10			0.95	5.74
Hypolimnion				19.5	23			2.49	6.21
North Inlet			3	19.5	8			0.48	6.30
Outlet				19.2	7			0.38	6.36

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.